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IMPORTANCE:

Currently, prevalence testing is the main source of data for process control management systems. However, when *Salmonella* is detected, prevalence testing does not provide the severity or amount of *Salmonella* in the sample. For quantification, the poultry industry currently relies on Most Probable Number (MPN) to estimate the load of *Salmonella* contamination throughout the processing chain. **MPN is not sustainable, labor intensive, and requires 27 – 72 h total time to results with large variation in estimation. Providing the poultry industry with a rapid and reliable quantification tool is vital to improve food safety throughout the processing chain.**

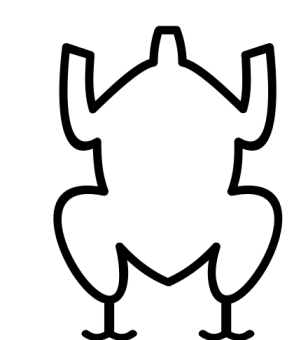
SIGNIFICANCE:

- 1) Pre-enrichment estimation of Log₁₀ CFU/mL *Salmonella*
- 2) Reduced time-to-results
- 3) Less labor per sample
- 4) Wider enumerable range
- 5) Decreased variation

PURPOSE:

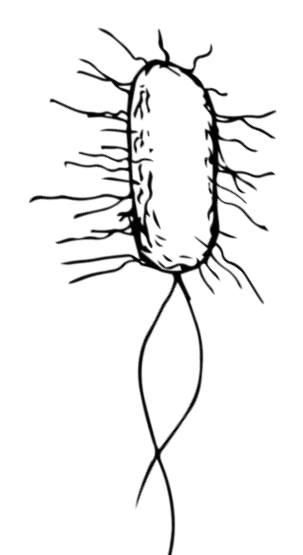
This study was conducted to compare the efficacy of BAX® Cycle Threshold (CT) values to the industry standard method of MPN when estimating pre-enriched Log₁₀ CFU/mL of *Salmonella* in pre-scald and re-hang chicken rinsates.

METHODS (SAMPLE PREPARATION):



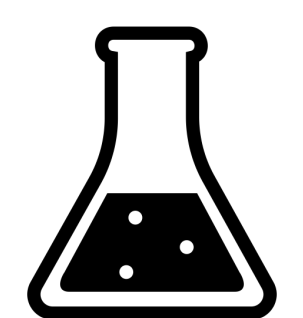
Pre-Scald and Re-Hang Bulk Rinsates

10 - 30 mL aliquot for each individual bulk rinsate
 1 biological rep × 9 inoculation levels + 1 negative control



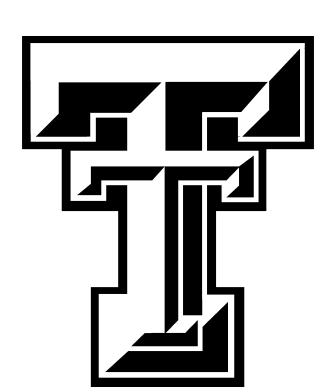
Inoculated with:

Salmonella Typhimurium
 1.0 – 5.0 Log₁₀ CFU/mL (Pre-Scald)
 1.0 – 5.0 Log₁₀ CFU/mL (Re-Hang)

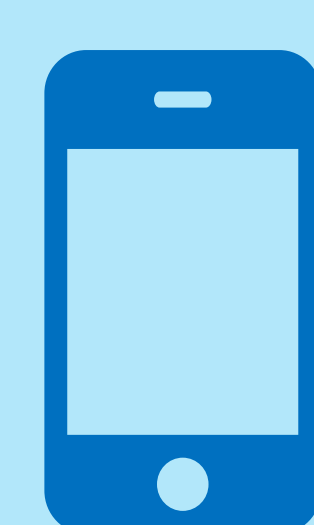


Enriched with:

30 mL Prewarmed 42°C BAX MP media combined with inoculated 30 mL rinsate aliquots



BAX® System Sal Quant provides rapid, accurate, and reliable estimations of *Salmonella*, compared to MPN, in whole bird rinsates



Scan QR code or visit:
[LANDING PAGE URL](#)
 For full abstract and more
 info on Sal Quant



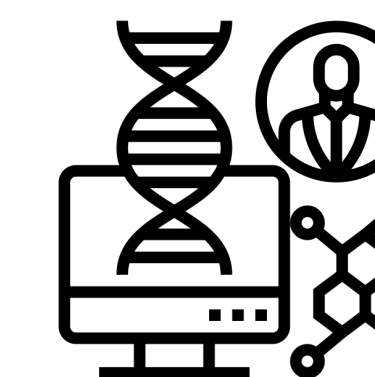
aenglishbey@hygiena.com

METHODS (QUANTIFICATION):



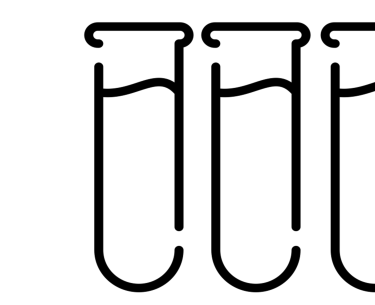
Incubation Parameters:

42°C for 4, 6, and 8 hours to determine appropriate enrichment parameters



PCR analysis per inoculation level:

BAX® System Q7 Real-Time PCR Assay for *Salmonella*
 5 technical replicates per inoculation level (lysates)
 Collect **Cycle Threshold (CT) values to estimate Log₁₀ CFU/mL of *Salmonella*** in pre-enrichment rinsates

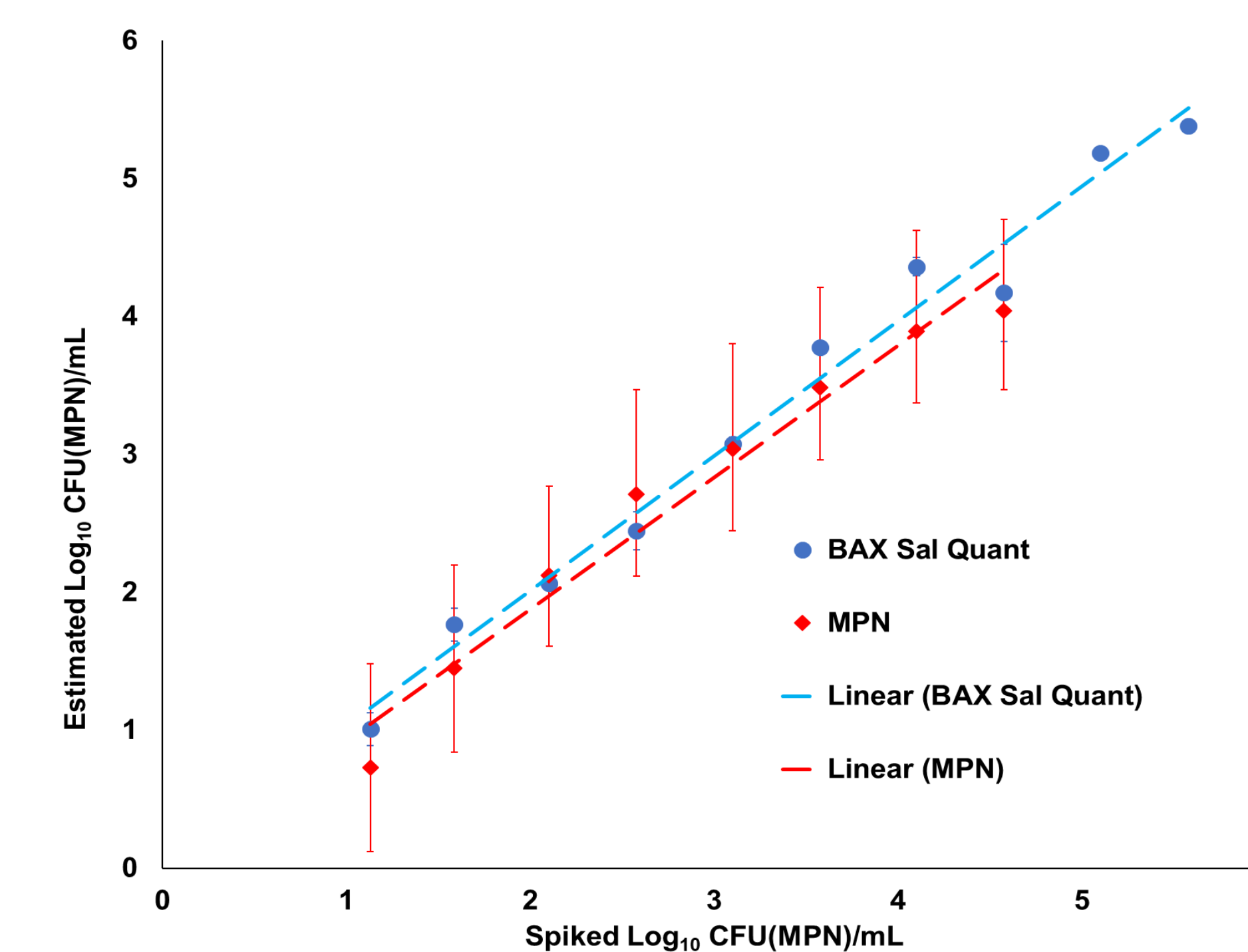


3 × 5 Tube MPN at each inoculation level for estimation comparison

RESULTS:

For both Pre-Scald and Re-Hang rinsates, utilization of BAX® System Sal Quant provides a wider enumerable range and less variation in estimation at each inoculation level compared to the 3 × 5 tube MPN.

When developing the linear fit equations for both rinsates, quality control parameters of a R² > 0.85 and Log Root Mean Square Error (RMSE) < 0.50 are utilized to determine the best fit linear equation and enrichment parameters. Therefore, a 6 hour enrichment with prewarmed 42°C BAX MP in combination with the respective linear fit equations accurately estimates Log CFU/mL₁₀ of *Salmonella* in Pre-Scald and Re-hang rinsates

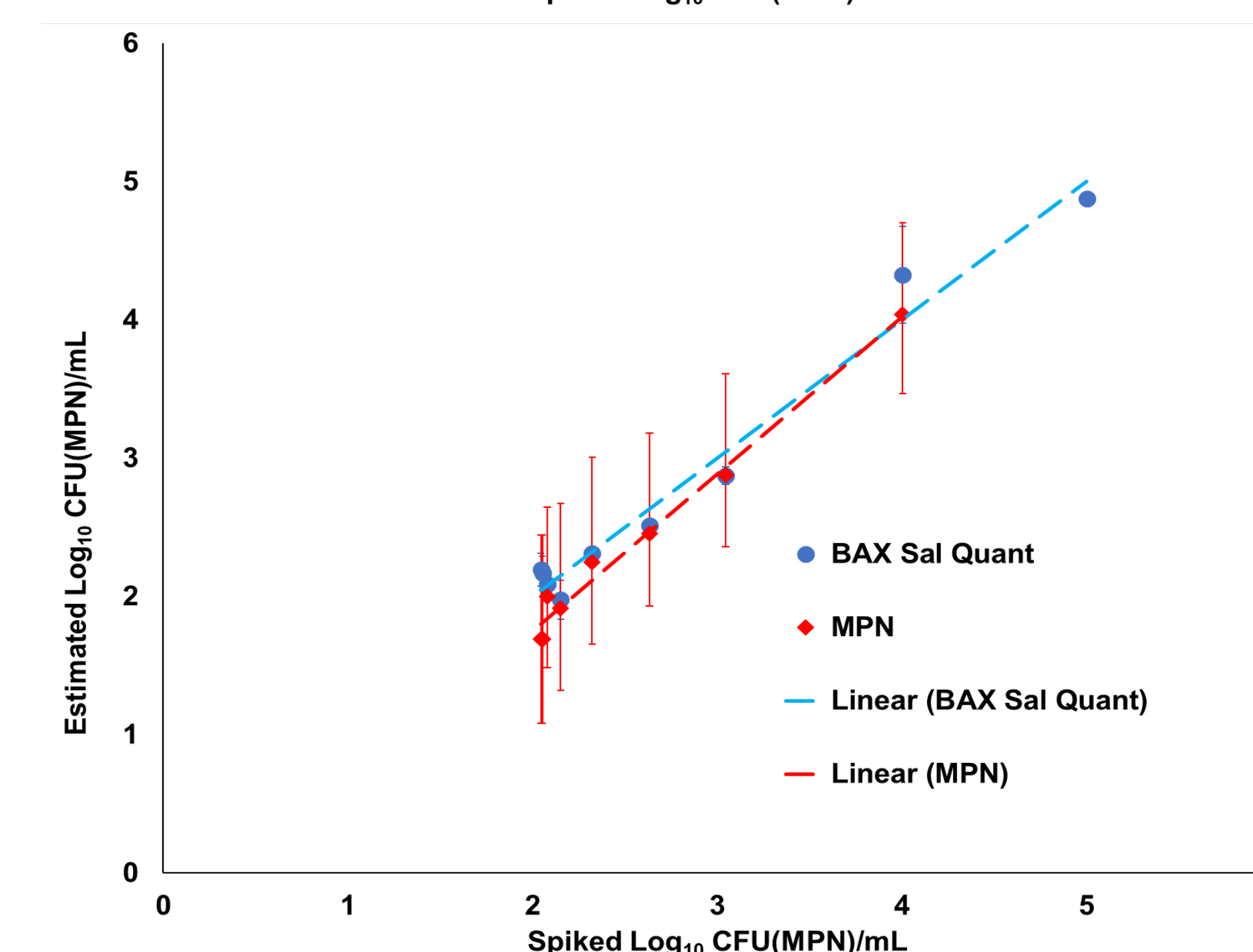


Pre-Scald Rinsate

Inoculation Range =
 1.0 – 5.0 Log₁₀ CFU/mL
 R² = 0.96

Log RMSE = 0.29

*Error bars are representative of RMSE and Upper and Lower Confidence Intervals for Sal Quant and MPN, respectively.



Re-Hang Rinsate

Inoculation Range =
 2.0 – 5.0 Log₁₀ CFU/mL
 R² = 0.90

RMSE = 0.34

**Naturally occurring

Salmonella = 2.0 Log CFU/mL

*Error bars are representative of RMSE and Upper and Lower Confidence Intervals for Sal Quant and MPN, respectively.